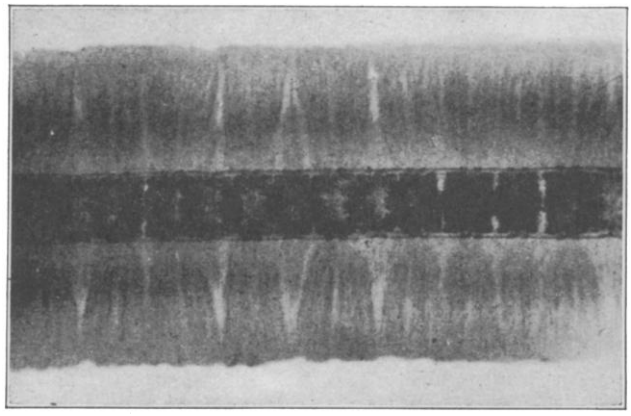
A METHOD OF DEMONSTRATING THE SHEATH STRUCTURE OF A DESMID

The structure of the cell wall in the Desmids is intimately concerned with the method of formation of the mucilaginous sheath, which in many members of the group is found to surround the cell. In the Saccodermae the wall is believed to be continuous thruout, having no pores communicating with the exterior. On the other hand, the Placcodermae in addition to other distinguishing characteristics frequently show pores connecting the protoplast with the surrounding medium.[1] In the Placcodermae it is considered that the mucus exudes thru the pores, and may accumulate outside the cell wall, so forming the sheath. It is not usually possible to observe directly evidence of this extrusion, but in the filamentous desmid *Hyalotheca dissiliensis* (Sm.) Bréb. the sheath shows under reduced illumination striae radiating from a zone around the ends of each cell.



HYALOTHECA DISSILIENSIS (Sm.) Bréb.

Showing sheath stained with Methylene Blue and Picric Acid. Magnification 415 diameters. Photomicrograph with 100 watt condensed filament lamp, Wratten K_3 and B screens, ⅛" Objective, X10 Ocular, field and sub-stage condensers.

The usual methods of staining algal cells, when applied in this case with the hope of more clearly demonstrating the structure of this sheath, caused much distortion. In the summer of 1919 at the Marine Biological Laboratory Woods Hole, Massachusetts, the writer worked out the following method for the use of the students, and as it has been tried out on subsequent occasions with uniformly satisfactory results, it is offered

[1] In this respect see Lütkemüller, J., Die Zellmembran der Desmidiaceen. Beiträge zur Biologie der Pflanzen, (Cohn), 8:347–414. 1902.

as being suited for use with classes. The great abundance in which *Hyalotheca dissiliensis* (Sm.) Bréb. often occurs makes it peculiarly convenient, but the method is no doubt adaptable for use with other forms.

Fresh living material is placed in a .05% aqueous solution of Methylene Blue for 45 to 60 seconds. It is then removed, rinsed in distilled water and placed in a $\frac{1}{10}$ saturated aqueous solution of Picric Acid. This serves to fix the stain and brings out in a most striking manner the striations in the sheath. The material may be examined in the Picric Acid solution, or removed after a minute or two to water. Preparations are best used soon after staining, as the sheath begins to disintegrate after a few hours.

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